Earthquake Test Study Guide

1. Elastic Rebound Theory
    a. Apply a force to object within the boundaries of its strength it will bend (build-up and retention of energy).
    b. Let it go, it will rebound (release of energy).
    c. Apply a force to object greater than its strength it will break (build-up and release of energy),
    d. Energy is released in waves (Earthquake) radiating away from the center of the earthquake (Epicenter).
2. Faulting – Brittle deformation:
    a. Normal – Tension – hanging wall moves down – divergent plate boundaries
    b. Reverse – Compression – hanging wall moves up – convergent plate boundaries
    c. Strike-slip fault – Sheer – transform plate boundaries
        i. Left lateral
        ii. Right lateral
        iii. San Andreas fault
    d. Horsts and Grabens
3. Folding – Ductile deformation
    a. Law of Original Horizontality
    b. Law of Superposition
    c. Anticline and Syncline
    d. Symmetrical, Asymmetrical, Overturned, Recumbent
    e. Found at continental – continental plate boundaries
4. Earthquakes
    a. Sources of earthquakes (natural and man-made)
        i. Movement along a fault
        ii. Subduction zone
        iii. Volcanoes
        iv. Landslide
        v. Mining
        vi. Fracking
    b. Focus vs. Epicenter
    c. Aftershocks and Foreshocks
    d. Measuring Earthquakes
        i. Seismometers/ Seismographs (instrument that does the recording)
        ii. Seismogram (record of the earthquake)
        iii. Richter vs. Mercalli vs. Moment Magnitude (Earthquakes and Seismic Waves worksheet)
        iv. Creep-meter, Tiltmeter, Laser-ranging devices, GPS (Monitoring Earthquakes worksheet)
    e. Triangulation – Finding the Epicenter (High point question on test)
    f. Where do earthquakes occur and why?
        i. Ring of Fire
        ii. Mediterranean Sea

iii. Mid-Atlantic Ridge

g. What is a wave?
h. Types of Earthquake Waves
    i. Body Waves
        1. P-Wave – fastest, vibration longitudinal to the wave pulse
        2. S-Wave – slower, vibration perpendicular to the wave pulse
    ii. Surface waves
        1. Love waves
        2. Rayleigh waves
i. Wave transmission through the Earth
    i. P-waves pass through from one side to the next.
    ii. S-waves stopped at mantle – outer core boundary
j. What is a Tsunamis?
    i. Triggers – natural and man-made
    ii. Earthquakes, Volcanoes, Glacial calving, Meteorite impacts, Turbidites
    iii. Underwater explosions (bombs)
k. Earthquake ready structures
    i. Building codes
        1. What are they?
        2. Why do we need them?
        3. Are they the same regardless of where you live?
    ii. Measure taken when building in an earthquake zone
        1. Steel-reinforced concrete
        2. Cross bracing
        3. Wide base
        4. Single story
        5. Taper building towards the top
        6. Lead bumpers at base
        7. Carbon fiber cables
    iii. How does building in an earthquake zone differ from building in an area prone to flooding or Tsunamis?